

while still being within the spirit and scope of the present invention. It is understood, therefore, that this invention is not limited to the particular embodiment disclosed but is intended to cover modifications within the spirit and scope of the present invention as defined by the appended claims.

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What is claimed is:

## CLAIMS

1. An access system for providing interactive access to information available from an information source through a television distribution system which includes:

5 a television distribution network having a network headend, a plurality of terminal ends, a plurality of upstream channels, and a plurality of downstream channels, each downstream channel for carrying a television transmission;

headend distribution equipment interfaced to the network headend of the television distribution network for distributing the television transmissions over the respective downstream channels of the television distribution network; and

10 a plurality of terminals, each terminal being interfaced to a terminal end of the television distribution network for receiving the television transmissions over the respective downstream channels of the television distribution network, each terminal also being interfaced to a display device for displaying a selected one of the television transmissions;

15 the access system comprising:

an input device associated with one of the terminals for inputting into the terminal a command for information from the information source;

an upstream transmitter associated with the terminal and interfaced to the respective terminal end of the television distribution network for transmitting the inputted command on an upstream channel of the distribution network;

20 a headend server associated with the headend distribution equipment, the headend server being interfaced to the information source;

an upstream receiver associated with the headend distribution equipment and interfaced to the headend server for receiving the inputted command on the upstream channel of the distribution network and for forwarding the received command to the headend server, the headend server transmitting a command based on the forwarded received command to the information source, the information source transmitting the information to the headend server in response to the command transmitted to the information source;

25 a data encoder associated with the headend distribution equipment, the data encoder being interfaced to the headend server for receiving the information from the headend

server and for encoding the received information into at least one of the television transmissions;  
and

a data decoder interfaced to the terminal for decoding the encoded information  
from the television transmissions, the decoded information being displayed on the display  
5 device.

2. The access system of claim 1 wherein the input device is also for inputting into the  
terminal a selection of one of the plurality of downstream channels for display on the display  
device.

3. The access system of claim 1 wherein the input device is a computer-style keyboard.

4. The access system of claim 3 wherein the terminal includes an infrared receiver  
interfaced thereto and wherein the keyboard includes an infrared transmitter for transmitting  
15 keystroke signals to the infrared receiver of the terminal.

5. The access system of claim 1 wherein the terminal includes an infrared receiver  
interfaced thereto and wherein the input device is a remote control device having an infrared  
transmitter for transmitting remote control signals to the infrared receiver of the terminal.

6. The access system of claim 1 wherein the information source is an Internet service  
provider, the access system further including an Internet router interfaced to the headend server  
for routing transmitted Internet commands and transmitted Internet information.

7. The access system of claim 1 wherein the transmitted information from the information  
source is in a first data form, and wherein the headend server includes a graphics processor for  
converting the transmitted information from the first data form to a second graphics form  
compatible with the display device.

8. The access system of claim 1 wherein each upstream channel of the television distribution network is multiplexed into a plurality of upstream slots, and wherein the terminal is assigned to at least one of the upstream slots at any one time.

5           9. The access system of claim 1 wherein each upstream channel of the television distribution network is multiplexed into a plurality of upstream slots, wherein at least one of the upstream slots is a session request slot for allowing any of a plurality of the terminals to request a session.

10           10. The access system of claim 9 wherein the session request is received by the headend server, the headend server assigning the requesting terminal to at least one of the upstream slots.

15           11. The access system of claim 10 wherein the headend server includes a noise detector for detecting a noise level on each of the upstream channels, the headend server re-assigning the terminal from a first upstream channel to a second upstream channel if necessary based on the noise level of the first upstream channel and the second upstream channel.

20           12. The access system of claim 10 wherein the headend server includes a noise detector for detecting a noise level on each of the upstream channels, the headend server directing the terminal to transmit at a higher level on the upstream channel if necessary based on the noise level of the upstream channel.

25           13. The access system of claim 1 comprising:  
a plurality of input devices, each input device associated with one of a plurality of the terminals;  
a plurality of upstream transmitters, each upstream transmitters associated with one of the plurality of the terminals; and  
a plurality of data decoders, each data decoder interfaced to one each of the plurality of the terminals;  
30           the headend server being a centralized processor for each of the plurality of the terminals;

wherein the upstream receiver receives a plurality of inputted commands from the plurality of terminals on the upstream channel of the distribution network and forwards the respective received commands to the headend server, the headend server transmits commands based on the respective forwarded commands to the information source, the information source transmits the information to the headend server in response to the respective commands transmitted to the information source, each command transmitted to the information source causing respective information to be transmitted from the information source, the data encoder receives the respective information from the headend server and encodes the received respective information into at least one of the television transmissions, and each of the data decoders in the respective terminals decodes the respective encoded information from the television transmissions.

14. The access system of claim 1 wherein the headend server includes a screen renderer for rendering screens for display at the display device interfaced to the terminal, and wherein the decoded information displayed on the display device includes the rendered screens.

15. A method for providing interactive access to information available from an information source through a television distribution system which includes:

a television distribution network having a network headend, a plurality of terminal ends, a plurality of upstream channels, and a plurality of downstream channels, each downstream channel for carrying a television transmission;

headend distribution equipment interfaced to the network headend of the television distribution network for distributing the television transmissions over the respective downstream channels of the television distribution network; and

a plurality of terminals, each terminal being interfaced to a terminal end of the television distribution network for receiving the television transmissions over the respective downstream channels of the television distribution network, each terminal also being interfaced to a display device for displaying a selected one of the television transmissions;

the method comprising the steps of:

inputting a command for information from the information source into one of the terminals;

transmitting the inputted command from the inputted-into terminal on an upstream channel of the distribution network;

receiving the inputted command on the upstream channel of the distribution network at the headend of the television distribution network;

5 forwarding the received command to a headend server at the headend;

transmitting a command based on the forwarded received command from the headend server to the information source;

transmitting information from the information source to the headend server in response to the command transmitted to the information source;

10 encoding the transmitted information into at least one of the television transmissions, the encoding step being performed at the headend;

decoding the encoded information from the television transmissions, the decoding step being performed at the terminal; and

displaying the decoded information on the display device.

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16. The method of claim 15 wherein the inputting step comprises transmitting keystroke signals from an infrared transmitter interfaced with a computer-style keyboard to an infrared receiver interfaced with the terminal.

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17. The method of claim 15 wherein the inputting step comprises transmitting remote control signals from an infrared transmitter interfaced with a remote control device to an infrared receiver interfaced with the terminal.

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18. The method of claim 15 wherein the information source is an Internet service provider, the method comprising the steps of:

transmitting the command based on the forwarded received command from the headend server to the Internet service provider by way of an Internet router interfaced to the headend server; and

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transmitting the information from the Internet service provider to the headend server in response to the command transmitted to the Internet service provider by way of the Internet router.

19. The method of claim 15 wherein the transmitted information from the information source is in a first data form, the method further including the step of converting the transmitted information from the first data form to a second graphics form compatible with the display device.

20. The method of claim 15 further comprising the steps of:  
multiplexing each upstream channel of the television distribution network into a plurality of upstream slots; and  
assigning the terminal to at least one of the upstream slots at any one time.

21. The method of claim 15 further comprising the steps of:  
multiplexing each upstream channel of the television distribution network into a plurality of upstream slots, at least one of the upstream slots is a session request slot; and  
transmitting a session request on the session request slot by any of a plurality of the terminals.

22. The method of claim 21 further comprising the steps of:  
receiving the session request by the headend server; and  
assigning, by the headend server, the requesting terminal to at least one of the upstream slots.

23. The method of claim 22 further comprising the steps of:  
detecting a noise level on each of the upstream channels; and  
re-assigning the terminal from a first upstream channel to a second upstream channel if necessary based on the noise level of the first upstream channel and the second upstream channel.

24. The method of claim 22 further comprising the steps of:  
detecting a noise level on each of the upstream channels; and  
directing the terminal to transmit at a higher level on the upstream channel if necessary based on the noise level of the upstream channel.

25. The method of claim 15 comprising the steps of:

inputting a plurality of commands for the information source into a respective plurality of the terminals;

transmitting each of the plurality of commands from the respective inputted-into terminal on an upstream channel of the distribution network;

5 receiving the plurality of commands on the upstream channel of the distribution network and forwarding the respective received commands to the headend server;

centrally processing each of the plurality of respective received commands at the headend server;

10 transmitting commands based on the respective forwarded received commands from the headend server to the information source;

transmitting information from the information source to the headend server in response to the respective commands transmitted to the information source, each command transmitted to the information source causing respective information to be transmitted from the information source to the headend server;

15 encoding the respective transmitted information into at least one of the television transmissions, the encoding step being performed at the headend; and

decoding the encoded information from the television transmissions, the decoding step being performed at the respective terminals.

20 26. The method of claim 25 further comprising the steps of:

sending a command from a first terminal to the headend server, the command being a message; and

routing the message from the headend server to a second terminal.

25 27. The method of claim 15 further comprising the step of rendering screens at the headend server for display at the display device interfaced to the terminal.

28. A method for providing real-time interactive access in a television distribution system which includes:

30 a television distribution network having a network headend, a plurality of terminal ends, a plurality of upstream channels, and a plurality of downstream channels, each downstream



channel for carrying a television transmission to the terminal ends, each upstream channel for carrying data transmissions to the network headend;

headend distribution equipment interfaced to the network headend of the television distribution network for distributing the television transmissions over the respective downstream channels of the television distribution network; and

a plurality of terminals, each terminal being interfaced to a terminal end of the television distribution network for receiving the television transmissions over the respective downstream channels of the television distribution network, each terminal also being interfaced to a display device for displaying a selected one of the television transmissions;

the method comprising the steps of:

inputting first data into one of the terminals;

transmitting the inputted first data from the inputted-into terminal on an upstream channel of the distribution network;

receiving the transmitted first data on the upstream channel of the distribution network at the headend distribution equipment;

transmitting a first acknowledgment of the received first data from the headend distribution equipment on a downstream channel of the distribution network;

receiving the transmitted first acknowledgment on the downstream channel of the distribution network at the terminal;

transmitting second data from the headend distribution equipment on a downstream channel of the distribution network;

receiving the transmitted second data on the downstream channel of the distribution network at the terminal;

transmitting a second acknowledgment of the received second data from the terminal on an upstream channel of the distribution network; and

receiving the transmitted second acknowledgment on the upstream channel of the distribution network at the headend distribution equipment;

wherein each of the transmitting steps on a downstream channel includes the step of encoding information into at least one of the television transmissions; and

wherein each of the receiving steps on a downstream channel includes the step of decoding the encoded information from the television transmissions.